[JP,2000-345493,A]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to lightweight dull tone lusterless coated paper about the lusterless coated paper for printing.
[0002]
[Description of the Prior Art] In recent years, to printed matter, a photograph and a design are used abundantly and there is a strong (henceforth visualization) request which is going to transmit the contents powerfully visually by colorizing further etc. On the other hand, there is a strong request from points, such as saving resources, transportation, and mailing cost, also to lightweight-izing of printed matter. The coated paper of grade which these two requests conflict and fits visualization has many stencil paper basis weights and amounts of coating, and is not suitable to the request of lightweight-izing. Coated paper is divided roughly into high gloss coated paper and lusterless coated paper. High gloss coated paper is art paper, super art paper, etc. which were conventionally used for high-class printing, and a printing result is a gross tone also with high blank paper gloss and printing gloss. Lusterless coated paper has a dull tone and mat tone by blank paper gloss and printing gloss. A mat tone is the printed matter of sensibility with which gloss settled down in the flat low as for the blank paper side and the printing side, and although blank paper glossiness is low, printing glossiness is [a dull tone] high [of a gross tone and a mat tone / middle]. As for the dull tone, the high-class feeling of need which settled down from the thing of the conventional gross tone is increasing good rareness and in recent years. For example, the typical quality of the dull art paper of basis-weight 157 g/m2, the amount 40 of double-sided coating - 50 g/m2, and consistency (bulk density) 1.18 g/cm3 serves as 35% of 75-degree glossiness, and 55% (4 color reprint section) of 60-degree printing glossiness as dull art paper (printing and 188 page paper business Times company 1996 issue of forms).
[0003] If it is going to lightweight-ize the lusterless coated paper of this dull tone, the stencil paper basis weight and the amount of coating of the above-mentioned dull art paper are made into one half, for example and it is the thing of total basis-weight 60 g/m2 Printing glossiness falls remarkably, and becomes about 10 - 30%, and a possibility that opacity may fall and the problem of flesh-side projection may occur increases, and stiffness is insufficient and it becomes impossible to maintain further the printing operability by which ****** to a printing machine became unstable and was stabilized. The total basis weight of 60g/with m2, that printing glossiness should be improved, if the amount of coating of a coating layer is made [many], about the part stencil paper basis weight, a lowering colander will not be obtained, but opacity and stiffness will run short increasingly, and it will not be used. if a stencil paper basis weight is

made to increase that it should improve even to extent with this practical opacity and stiffness -- that part next time -- the amount of coating -- very -- few -- not carrying out -- it will not obtain, but surface covering nature will be insufficient, and printing glossiness will become a very low indistinct image. Moreover, although the approach of carrying out internal [of an inorganic loading material like a titanium dioxide with large opacity] to stencil paper is well-known as an approach of improving opacity, if it carries out internal [of the inorganic loading material], the consistency of stencil paper will increase conversely and stiffness will fall. The approach of blending the synthetic organic fizz loading material (for example, a trade name EXPANSEL, the product made from Japanese FIRAITO, Inc.) which it considers as the approach of lightweight-izing stencil paper, maintaining opacity and stiffness, and the approach of blending the capsule of the synthetic organic substance in the air with JP,52-118116,B is indicated, and is made to foam with the heat of the dryer at the time of paper making is learned. However, the desiccation conditions at the time of paper making etc. are difficult to obtain the stable operating condition, and these approaches cannot say it for them with it being suitable for a form being mass-produced. Moreover, although it is not a loading material, the approach of adding a detailed fibrillation cellulose to JP,8-13380,A is proposed. However, it is necessary to adjust a detailed fibrillation cellulose independently, and industrial application to the report grade paper to which it is difficult to which to adjust freeness for the freeness of pulp by more than CSF400ml and the pulp which blended many mechanical pulp although it needed to be made desirable more than CSF500ml at the time of paper making, and it uses mechanical pulp for it further cannot be performed by this approach.

[0004] Thus, in mere application of a Prior art, the lightweight-ized dull tone coated paper with a desired property cannot be obtained.

[0005]

[Problem(s) to be Solved by the Invention] The technical problem of this invention is in view of such a situation to offer the lightweight dull tone lusterless coated paper which has the opacity suitable for practical use, and stiffness and which has high printing glossiness relatively in spite of low blank paper gloss.

[0006]

[Means for Solving the Problem] This invention etc. contains mechanical pulp 10% of the weight or more as paper pulp, as a result of inquiring wholeheartedly about the above-mentioned technical problem. In in the paper [Hara] it contained three to 12% of the weight per Shigekazu Kami, a non-fixed form silica as a loading material A pigment particle is coated paper which prepared the coating layer of the pigment which has the particle size distribution included 65% or more in the range of 0.4-4.2 micrometers on volume criteria. When the temperature of a rigid roll processes this coated paper in a software nip calender 150 degrees C or more, there is thickness of paper by the low consistency also with a low basis weight, therefore opacity and stiffness can be maintained at the condition of being sufficient for practical use. While it has been low, blank paper glossiness The image with high printing glossiness could be obtained relatively, it found out that said technical problem was solved, and this invention was completed. The pulp which constitutes stencil paper needs making mechanical pulp contain 10% of the weight or more. It is rare to crush paper by the paper-making process by these pressures of various kinds of, and since it becomes bulky as a whole, the increase of the amount of openings inside stencil paper and opacity improve, and, as for the stencil paper with which mechanical pulp blended mechanical pulp since fiber was upright compared with chemical pulp, stiffness also becomes large at coincidence. The contribution to the reduction in a consistency can use

grand pulp preferably highly also in mechanical pulp. At less than 10 % of the weight, even if the loadings of mechanical pulp optimize a loading material and calender conditions, they cannot obtain sufficient opacity and stiffness. As for mechanical pulp, it is desirable to carry out from a whiteness degree or the point of coating proper ** to 60 or less % of the weight of paper pulp. Although especially the tree species of mechanical pulp are not limited, a part with fiber big and rough [gum wood, MEPURU, a birch, etc.] and stencil paper tend to become a low consistency. Especially pulp other than mechanical pulp cannot be limited, and can use chemical pulp and recycled pulp. Especially use of recycled pulp is desirable the point which can use the mechanical pulp in used paper as the mechanical pulp of this invention, and in respect of effective use of a resource.

[0007] A loading material makes Hara Kaminaka contain non-fixed form silicate three to 12% of the weight per Shigekazu Kami under the above-mentioned pulp conditions. At less than 3 % of the weight, coating stencil paper does not become a low consistency, and even if it optimizes pulp combination and calender conditions, sufficient low consistency stencil paper cannot be obtained. Conversely, when it blends exceeding 12 % of the weight, the loading material particle number per pulp weight increases, and after the probability for association between fiber to be checked becoming high and preparing a coating layer, surface reinforcement suitable for printing workability cannot be maintained. Moreover, it is desirable still more desirable that it is 0.2-0.8g/ml, and the relative bulk density of non-fixed form silicate is 0.4-0.7g/ml. When relative bulk density uses the coating stencil paper containing non-[less than 0.2g //ml] fixed form silicate, the surface reinforcement of coated paper itself falls. When relative bulk density uses the coating stencil paper containing the non-fixed form silicate which exceeds ml in 0.8g /, the consistency of coated paper becomes high and it becomes difficult to obtain the low consistency bulky paper made into the purpose. The non-fixed form silicate of this invention is the light metal salt of a water silicic acid, and can illustrate a water sodium silicate, hydrated Al silicates, hydrated-Al-silicates sodium, a water calcium silicate, a water magnesium silicate, etc. Non-[these] fixed form silicate may be used independently, or may be used together two or more sorts.

[0008] Although the basis weight of stencil paper can use suitably a 30 used for common coated paper - about two 400 g/m thing, it is especially 25 - 60 g/m2 that the effectiveness of this invention becomes remarkable two or less 80 g/m from which the opacity of stencil paper and ****** pose a problem.

[0009] It is important to use the pigment of the particle size distribution included 65% or more in the range of 0.4-4.2 micrometers on volume criteria as a pigment for coating. Although the particle which goes into the range of 0.4-4.2 micrometers on volume criteria is 65% or less, and blank paper glossiness becomes high when the pigment with which volume integral cloth particle size contains many small particles is used, as compared with the case where a pigment with many particles with a large volume integral cloth particle size is used, printing side glossiness is low and inferior also in stencil paper covering nature. Therefore, when a pigment with many particles with a small volume integral cloth particle size is used and the amount of coating is reduced, it is difficult to manufacture bulky lusterless coated paper equipped with the blank paper appearance which was excellent even if it increased the stencil paper basis weight, and the printability. Moreover, it is difficult to manufacture bulky lusterless coated paper equipped with the blank paper appearance which blank paper glossiness became low too much as compared with the case where a pigment with many particles with a small volume integral cloth particle size is used although printing glossiness and stencil paper covering nature became good when the

pigment which the particle which goes into the range of 0.4-4.2 micrometers on volume criteria is 65% or less, and contains many particles with a large volume integral cloth particle size was used, and was excellent too, and the printability.

[0010] it is organic pigments, such as inorganic pigments, such as the kaolin and clay which especially a limit will not have if the class of pigment used by this invention fulfills this volume criteria distribution, and are used from the former as a pigment for coating, delaminated clay, whiting, precipitated calcium carbonate, talc, a titanium dioxide, a barium sulfate, a calcium sulfate, a silicic acid, a silicate, colloidal silica, and a satin white, and a plastics pigment, and these pigments are independent if needed -- or two or more sorts can use it, mixing. In this invention, although it is desirable to usually use two or more pigments together in order to acquire desired properties, such as quality of coating proper ******** of a coating, it is important that it is the particle size distribution in which a particle is contained 65% or more in the range of 0.4-4.2 micrometers on volume criteria as the whole pigment in that case. The pigment of this invention is used as a thing of the range which the description is in particle size distribution, and has distribution with many things of a comparatively big particle size, and chooses and uses the pigment which has these distribution beforehand compared with the pigment for coating usually used, or classifies, and is specified by this invention. By doing in this way, whenever [covering / on the front face of stencil paper] can be raised also in the amount of low coating, and in spite of being low blank paper glossiness, high printing side glossiness can be obtained relatively.

[0011] Thus, the obtained coated paper needs to perform surface finish in the elevated-temperature software nip calender which consists of an elastic roll and a rigid roll heated at 150 degrees C or more. Although stencil paper or a coating layer can be graduated by such low nip pressure that rigid roll temperature is high or the short nip residence time if the content moisture of coated paper is suitable, this effectiveness cannot be acquired at less than 150 degrees C. Opacity is high and it becomes bulky lusterless coated paper by the low consistency with stiffness, since it can consider as the low nip pressure and short nip residence time in order to obtain blank paper glossiness and printing glossiness comparable as being obtained using the conventional supercalender in an elevated-temperature software nip calender, the consistency of a coating layer and stencil paper becomes low, processing speed is quicker than the supercalender of the top former, and since a frame substitute of rolling up etc. is omissible, it can produce efficiently and excels in operability.

[0012]

[Embodiment of the Invention] The lusterless coated paper of this invention blends mechanical pulp with paper pulp, such as chemical pulp and recycled pulp, 10% of the weight or more, carries out beating to it, and makes it a pulp slurry, it adds so that it may become 3 - 12 % of the weight per stencil paper weight about non-fixed form silicate at this, and let it be pulp. A loading material is the purpose which adjusts the paper-making fitness and the strength property of a pulp slurry, and may mix and have a small amount of talc in addition to non-fixed form silicate, a kaolin, whiting, precipitated calcium carbonate, and titanium oxide.

[0013] Paper making of the chemicals, for example, a paper reinforcing agent, usually used for these pulp at a paper-making process if needed, a sizing compound, a defoaming agent, the coloring agent, etc. is added and carried out. Especially the paper-making approach is not limited and carries out paper making using the long network machine containing a top wire etc., a round mesh machine, these both concomitant use machine, a Yankee dryer machine, etc. by acid paper making, neutral paper making, and the alkaline paper-making method. Moreover, size press, a

gate roll coater, and pre meta ring size press can be used, and the stencil paper which carried out reserve coating of starch, the polyvinyl alcohol, etc., and the stencil paper which carried out reserve coating of the coating liquid containing a pigment and adhesives above further can also be used.

[0014] Coating of the coating which fulfills the particle size distribution of this invention and which blended the additive for independent or the mixed pigment adhesives and if needed is carried out in the Hara paper. The styrene butadiene system by which adhesives are used for coated paper from the former, Styrene acrylic, ethylene and a vinyl acetate system, a butadiene methyl methacrylate system, Various copolymers, such as a vinyl acetate butyl acrylate system, or polyvinyl alcohol, Synthetic adhesives, such as a maleic-anhydride copolymer, and an acrylic acid, a methyl methacrylate system copolymer; Casein, Protein, such as soybean protein and synthetic protein; Oxidized starch, electropositive starch, urea phosphorylation starch, Starch, such as etherification starch, such as hydroxy ethyl ether-ized starch, and a dextrin; one or more sorts of usual adhesives for coated paper, such as cellulosics, such as a carboxymethyl cellulose, a hydroxymethyl cellulose, and hydroxyethyl cellulose, are used, choosing suitably. these adhesives -- per [5] pigment 100 weight section - 50 weight sections -- it is more preferably used in the range of 10 - 30 weight section extent.

[0015] Moreover, as an additive blended if needed, various assistants blended with the usual pigment for coated paper, such as a dispersant, a thickener, a water retention agent, a defoaming agent, a deck-watertight-luminaire-ized agent, and a coloring agent, are used suitably.

[0016] The adjusted coating liquid carries out double-sided coating of one layer or more than a bilayer in the Hara paper using a bar coating machine, a roll coater, an air knife coating machine, a reverse roll coater, a curtain coating machine, a size press coating machine, a gate roll coater, etc. Although the amount of coating is determined according to a desired property, when a stencil paper basis weight is 60 g/m2 about in the case of this invention, when it is 6 - 10 g/m2 and 40 g/m2, it is the small amount of coating which is about two 5 - 8 g/m, and can obtain printing side glossiness with sufficient covering nature.

[0017] independent [, for example / in the dryer of various methods, such as the above-mentioned heating cylinder, a heating hot blast air dryer, a gas-heater dryer, an electric heater dryer, and an infrared heater dryer,] as an approach of drying a humid coating layer -- or it combines and uses.

[0018] In this invention, after carrying out coating desiccation of the coating liquid at the coating stencil paper mentioned above, pressurization finishing is carried out in an elevated-temperature software nip calender with a rigid roll temperature of 150 degrees C or more. As a rigid roll, a metal roll is desirable. Not only temperature but the nip residence time is important for an elevated-temperature software nip calender. From this point, by actual operation, the roll nominal diameter of 300mm or more, the Shore D degrees of hardness 80-100 of an elastic roll, and when it is 85-95 preferably and converts into the roll nominal diameter of 500mm, it is a part for 400-3000m/in **** rate. It is desirable to process by two or more calender nip numbers with a linear pressure 30 - 500 kg/cm, and 5 - 8% of before [a calender] coating moisture. In addition, a roll nominal diameter points out the roll (1990 TAPPI Finishing and Converting, P5) nominal diameter (equivalent diameter) which A.V.Lyons and others showed in the following formula. (Roll nominal diameter) =(diameter of software roll) x(diameter of chilled roll)/{(diameter of a software roll) + (diameter of a chilled roll)}

[0019]

[Example] Although an example is raised to below and this invention is explained more

concretely, of course, it is not limited to these examples. In addition, unless it refuses especially, the section in an example and % show weight %, respectively.
[0020] In addition, it examined based on the appraisal method as shown below about the obtained lusterless coated paper.
(Blank paper glossiness) JIS P It measured based on 8142.
(Printing glossiness) It is JIS using a RI-II mold printing tester about the front face of the printed matter which printed 0.30 cc using the sheet process ink (trade name TK yes, echo red MZ) by TOYO INK MFG. CO., LTD., and was obtained after neglect one whole day and night. P ****** measurement was carried out 8142.
(Consistency) JIS P It measured based on 8118.
(Reinforcement) After printing 0.40 cc using the special ink (trade name SMX tuck grade 15) by TOYO INK MFG. CO., LTD. using a RI-II mold printing tester, flesh-side picking was performed, it peeled off and visual evaluation of the condition was carried out on the following criteria.
O : -- very -- fitness, O:fitness, and **: -- a little inferior JIS x: inferior (opacity) P It measured based on 8138 and evaluation was performed on the following criteria.
O : -- fitness and **: -- a little inferior (stiffness) JIS It measured based on P8143 and evaluation was performed on the following criteria.
O : -- fitness and **: -- a little inferior [example 1]
The [preparation of coating liquid] engineer DOKAORIN (: with ECLIPS [by the en gel hard company]650, and a volume integral cloth particle size of 0.40-4.20 micrometers 65.3%) 80 section, To the pigment (: with a volume integral cloth particle size of 0.40-4.20 micrometers 66.6%) which consists of the particle whiting (FIMATEC, LTD. make : with FMT-90 and a volume integral cloth particle size of 0.40-4.20 micrometers 71.9%) 20 section The sodium-polyacrylate 0.2 section was added with the opposite pigment as a dispersant, the SERIE mixer distributed, and preparation of the pigment slurry whose solid content concentration is 70% was carried out. Thus, the styrene butadiene copolymer latex (glass-transition-temperature [of 15 degrees C], 75% of gel contents) 10 section of a non-thickening mold and the hydroxy ethyl ether-ized starch (PG295 by Penn Ford Co.) 6 section were added to the obtained pigment slurry, water was added further, and coating liquid of 60% of concentration was obtained.
Six weight sections content of the talc was carried out for hydrated-Al-silicates soda as a [stencil paper] loading material 4% of the weight per Shigekazu Kami (relative bulk density 0.4g/ml), and the basis weight of 46g which contains mechanical pulp 30% of the weight as paper pulp/the report grade paper of m2 was used as coating stencil paper.
Double-sided coating was performed by the blade coating machine of a coating rate for 800m/, and it dried so that paper moisture might become 5.5%, so that the amount of coating per one side might become 7 g/m2 in the stencil paper of [manufacture of coated paper] above about the above-mentioned coating liquid.
[Calender] Subsequently, by the roll nominal diameter of 400mm, the metal roll temperature of 160 degrees C, Shore hardness 85 of an elastic roll, and a part for /and 650m linear pressure in **** rate 40 kg/cm, software nip calender processing was performed on condition that number of calender nips 2 nip, and lusterless coated paper was obtained.
Seven weight sections content of the talc was carried out for hydrated-Al-silicates soda as a [example 2] loading material 3% of the weight per Shigekazu Kami (0.4g [/ml] relative bulk density), and coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains mechanical pulp 11% of the weight as paper pulp as

coating stencil paper.
10-% of the weight (0.4g [/ml] relative bulk density) content per Shigekazu Kami of the hydrated-Al-silicates soda was carried out as a [example 3] loading material, and coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains mechanical pulp 40% of the weight as paper pulp as coating stencil paper.
Coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains the mechanical pulp which carried out 6 weight sections content and was obtained [talc] from newspaper recycled pulp as paper pulp in hydrated-Al-silicates soda 4% of the weight per Shigekazu Kami (0.4g [/ml] relative bulk density) 30% of the weight as a [example 4] loading material as coating stencil paper.
As a [example 5] pigment, the kaolin (: with KAPIMU DG made from RIOKAPIMU, and a volume integral cloth particle size of 0.40-4.20 micrometers 68.4%) 70 section from Brazil, To the pigment (: with a volume integral cloth particle size of 0.40-4.20 micrometers 68.7%) which consists of the coarse-grain whiting (FIMATEC, LTD. make : with FMT-75 and a volume integral cloth particle size of 0.40-4.20 micrometers 69.5%) 30 section The sodium-polyacrylate 0.2 section was added with the opposite pigment as a dispersant, the SERIE mixer distributed, and coated paper was obtained by the same approach as an example 1 except having carried out preparation of the pigment slurry whose solid content concentration is 70%.
Nine weight sections content of the talc was carried out for hydrated-Al-silicates soda as a [example 1 of comparison] loading material 1% of the weight per Shigekazu Kami (0.4g [/ml] relative bulk density), and coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains mechanical pulp 15% of the weight as paper pulp as coating stencil paper.
13-% of the weight (0.4g [/ml] relative bulk density) content per Shigekazu Kami of the hydrated-Al-silicates soda was carried out as a [example 2 of comparison] loading material, and coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains mechanical pulp 17% of the weight as paper pulp as coating stencil paper.
Five weight sections content of the talc was carried out for hydrated-Al-silicates soda as a [example 3 of comparison] loading material 5% of the weight per Shigekazu Kami (0.4g [/ml] relative bulk density), and coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains mechanical pulp 8% of the weight as paper pulp as coating stencil paper.
Ten weight sections content of the talc was carried out as a [example 4 of comparison] loading material, and coated paper was obtained by the same approach as an example 1 except having used the report grade paper which contains mechanical pulp 20% of the weight as paper pulp as coating stencil paper.
Coated paper was obtained by the same approach as an example 1 except having changed the roll temperature of the software calender of the [example 5 of comparison] example 1 into 120 degrees C.
As a [example 6 of comparison] pigment, the particle clay (: with MIRASHEEN [by the en gel hard company], and a volume integral cloth particle size of 0.40-4.20 micrometers 60.2%) 80 section, To the pigment (: with a volume integral cloth particle size of 0.40-4.20 micrometers 62.5%) which consists of the particle whiting (FIMATEC, LTD. make : with FMT-90 and a volume integral cloth particle size of 0.40-4.20 micrometers 71.9%) 20 section The sodium-polyacrylate 0.2 section was added with the opposite pigment as a dispersant, the SERIE mixer

distributed, and coated paper was obtained by the same approach as an example 1 except having carried out preparation of the pigment slurry whose solid content concentration is 70%.
As a [example 7 of comparison] pigment, the 2nd class clay (: with DB coat [by the drive launch kaolin company], and a volume integral cloth particle size of 0.40-4.20 micrometers 57.6%) 60 section, To the pigment (: with a volume integral cloth particle size of 0.40-4.20 micrometers 63.3%) which consists of the particle whiting (FIMATEC, LTD. make : with FMT-90 and a volume integral cloth particle size of 0.40-4.20 micrometers 71.9%) 40 section The sodium-polyacrylate 0.2 section was added with the opposite pigment as a dispersant, the SERIE mixer distributed, and coated paper was obtained by the same approach as an example 1 except having carried out preparation of the pigment slurry whose solid content concentration is 70%.
As a [example 8 of comparison] pigment, the delaminated clay (: with DB plate [by the drive launch kaolin company], and a volume integral cloth particle size of 0.40-4.20 micrometers 48.1%) 25 section, The 2nd class clay (: with DB coat [by the drive launch kaolin company], and a volume integral cloth particle size of 0.40-4.20 micrometers 57.6%) 25 section, The particle clay (: with AMAZON made from KADAMU, and a volume integral cloth particle size of 0.40-4.20 micrometers 53.8%) 25 section, To the pigment (: with a volume integral cloth particle size of 0.40-4.20 micrometers 57.9%) which consists of the particle whiting (FIMATEC, LTD. make : with FMT-90 and a volume integral cloth particle size of 0.40-4.20 micrometers 71.9%) 25 section The sodium-polyacrylate 0.2 section was added with the opposite pigment as a dispersant, the SERIE mixer distributed, and coated paper was obtained by the same approach as an example 1 except having carried out preparation of the pigment slurry whose solid content concentration is 70%.
The Nippon Paper Industries fine coated paper "super P RENU Dx" of basis-weight 60.2 g/m2 by which the [example 9 of comparison] marketing is carried out was used for the comparison.
The Nippon Paper Industries fine coated paper "PIRENU Dx" of basis-weight 60.2 g/m2 by which the [example 10 of comparison] marketing is carried out was used for the comparison.
[0021] The above effectiveness was shown in Table 1.
[0022]
[Table 1]

表1

	体積分布粒径 0.40～4.20μm	無定形シリケート	機械パルプ	カレンダ温度	白紙光沢度	印刷光沢度	密度	表面強度	不透明度	剛度
	%	%	%	℃	%	%	g／m2			
実施例1	66.6	4	30	160	30	60	0.85	◎	○	○
実施例2	66.6	3	11	160	32	62	0.90	◎	○	○
実施例3	66.6	10	40	160	33	57	0.80	○	○	○
実施例4	66.6	4	30	160	27	57	0.87	○	○	○
実施例5	68.7	4	30	160	32	62	0.85	◎	○	○
比較例1	65.6	1	15	160	31	61	0.98	◎	△	△
比較例2	65.6	13	17	160	30	64	0.77	×	○	○
比較例3	65.6	5	8	160	29	67	0.98	△	△	△
比較例4	66.6	0	20	160	30	60	1.02	◎	△	△
比較例5	66.6	4	30	120	23	49	0.83	◎	○	○
比較例6	62.5	4	30	160	30	61	0.85	△	○	○
比較例7	63.3	4	30	160	25	52	0.85	○	○	○
比較例8	57.9	4	30	160	27	52	0.85	○	○	○
比較例9	-	-	-	-	50	60	1.20	○	△	△
比較例10	-	-	-	-	12	48	0.85	○	○	○

[0023]
[Effect of the Invention] By the configuration of this invention, lusterless coated paper excellent in a low consistency and printing glossiness can be obtained efficiently.

[Translation done.]

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